REMARKS

The Applicants thank the Examiner for a thorough search, and for considering the IDS filed October 14, 2003.

STATUS OF CLAIMS

Claims 1-65 are pending. Claims 1-26 have been rejected. Claims 27-65 are new. Claims 21 and 22 are amended to recite "wherein" instead of "where" to be consistent with the other claims. This amendment does not narrow claims 21 and 22 and is unrelated to patentability.

I. SUMMARY OF REJECTIONS

Claims 1-21, and 24-26 were rejected under 35 USC 103(a) as being allegedly unpatentable over *Derby et al.* (US Patent No. 5,359,593) in view of *Koskelainen et al.* (US Patent No. 6,570,851).

Claims 22 was rejected under 35 USC 103(a) as being allegedly unpatentable over *Derby et al.* (US Patent No. 5,359,593) in view of *Koskelainen et al.* (US Patent No. 6,570,851) further in view of *Dillon et al.* (US Patent No. 6,473,793).

Claims 23 was rejected under 35 USC 103(a) as being allegedly unpatentable over *Derby et al.* (US Patent No. 5,359,593) in view of *Koskelainen et al.* (US Patent No. 6,570,851) further in view of *Bushmitch* (US Patent No. 5,928,331).

II. INDEPENDENT CLAIMS 1, 5, 9, 13, AND 14

Claim 1 recites

> marking a first group of one or more packets of ***a data flow*** with a first behavioral treatment value, ...;
> determining ***an achieved flow bandwidth*** for ***the data flow*** based on data traffic within the network;
> determining ***a second behavioral treatment*** value based ***on the achieved flow bandwidth*** within the network; and
> marking a second group of one or more packets ***of said data flow*** with said second behavioral treatment value...(emphasis added).

Claims 5, 9, 13, and 14 include similar language. Thus, in claim 1 an "achieved flow bandwidth" is determined for a "data flow", and the second behavioral treatment is based on the achieved flow bandwidth determined for the data flow. In contrast, Derby et al. monitors the traffic, if appropriate, requests an adjustment of the bandwidth of the entire connection, and then if the adjustment is accepted, adjusts leaky bucket parameters prior to determining the achieved flow of the new bandwidth of the connection. Thus, the adjustment of the leaky bucket parameters (which the Office Action associates the behavioral treatments) are (1) based on whether there is a change in the bandwidth of the connection and (2) prior to monitoring the traffic at the new bandwidth and therefore prior to there even being a possibility of establishing an achieved flow bandwidth (even if Derby et al. were to determine an achieved flow). Consequently, the adjustment of Derby et al. is not based on an achieved flow bandwidth of a data flow.

The Office Action stated (page 2), "Derby discloses...dynamically adapting packets...based on achieved flow bandwidth information...(Column 2, lines 20-25)". The Applicants disagree. *Derby et al.* (at column 2, lines 14-25) states

> In order to avoid congestion and insure adequate traffic flow in packet communication networks, it is common to control the ***access of packet sources to the network*** on an ongoing basis. In order to successfully control traffic access, it

> is necessary, first, to accurately characterize the traffic so as to provide appropriate bandwidth for carrying that traffic. Simple measurements which provide accurate estimates of the bandwidth requirements of a source are taught in the copending application ....

This passage discusses controlling access of packet sources on an ongoing basis to a network by accurately characterizing the traffic so as to control bandwidth. However, this passage discusses controlling access to the network, which is different than "adapting packets of data." To adapt a packet implies somehow changing the packet, which is not taught or suggested in column 2, lines 15-25.

The Office Action (at page 2) continued,

> Derby discloses...routing a first group of one or more packets..., wherein the first behavioral treatment value ***directs devices within the network*** to treat the first group of one or more packets with a first quality of service treatment (Column 5, lines 47 - 55)...(emphasis added).

The Applicants disagree. *Derby et al.* (at column 5, lines 47-55) states

> As described in connection with FIG. 1, when a new connection is to be set up through network 10, an initial estimate of the traffic characteristics is made by the packet source. This estimate arrives at the bandwidth management system of FIG. 3 on line 36 together with the quality of service requirements on line 35. Such quality of service (QOS) requirements include acceptable loss probabilities, acceptable delays, real-time delivery requirements, and so forth. Connection agent 32 passes these connection requirements on to path selection controller 30 which uses these requirements, together with the up-to-date network description in topology database 31 to calculate a connection path through network 10 (FIG. 1) which satisfies all of these requirements.

In other words, quality of service requirements and an initial estimate of traffic characteristics are used to select a path. However, in the above passage there is no discussion of directing devices in the network to treat packets with any particular quality of service treatment. In contrast to claim 1, the quality of service is used to determine the path, but there is no discussion in the above passage of directing devices in the network how to treat the packets based on the quality of service treatment.

The Office Action (at page 2), also stated,

> Derby discloses...determining ***an achieved flow bandwidth*** for the data flow based on data traffic within the network (Column 6, lines 21-27)...(emphasis added).

The Applicants disagree. Column 6, lines 20-30, state

> At the same time, estimation and adaptation module 33 begins monitoring this incoming traffic to determine if any significant changes in the ***incoming traffic characteristics*** have occurred during the life of the connection. If so, module 33 notifies connection agent 32 to request a new bandwidth allocation, supplying connection agent 32 with the new traffic parameters required for the connection.

The above passage discusses monitoring the traffic for any significant changes in "incoming traffic characteristics". However, there is no disclosure in the above passage as to whether "bandwidth" is one of those characteristics, and therefore there is also no disclosure in the above passage of "determining an achieved flow bandwidth" for a "data flow".

The Office Action (at page 3) states,

> Derby discloses...determining ...(Column 6, lines 30 - 34), but Derby discloses the changes being made to a leaky bucket function in the network to control the QoS of the data flow, not marking the packet header with new QoS information. Koskelainen teaches a network that uses differentiated services that uses DSCP values in the header to tell the network node how to process the packet thus controlling its QoS (Column 4, lines 20 - 29). Combining the teachings of Koskelainen and Derby would result in a system that changes the DSCP values on the packets of a flow in order to alter the bandwidth usage of that flow.

Thus, the Office Action concedes that Derby et al. does not disclose marking the packet header with new QoS information, and discloses changes being made to the "leaky bucket function" instead. To supplement this deficiency in Derby et al., the Office Action relies on Koskelainen et al.'s teaching to use DSCP for the alleged motivation of making Derby et al.'s system scalable.

However, the cited references in Derby et al. that refer to changing the "leaky bucket function" also are not a teaching to adjust the treatment of the packets in another form, and therefore are not a suggestion to determine a "second behavioral treatment value based on the achieved flow bandwidth within the network".

Specifically, column 6, lines 28-34, state,

> As before, connection agent 32 launches a new bandwidth request on line 37 requesting the ***adjustment of the bandwidth of the connection***. If the adjustment is accepted, the leaky bucket parameters are updated with the new traffic characteristics and estimation and adaptation module 33 continues to monitor the incoming traffic, but with the new characteristics.

In response to detecting a significant change in the characteristics (which are not disclosed in the passages cited to include bandwidth), an "adjustment of the bandwidth of the connection" is requested and if the request is accepted, then the leaky bucket parameters are adjusted (which is prior to determining the characteristics of the traffic resulting from the change in bandwidth). However, the above passage does not disclose what the leaky bucket parameters are. There is no disclosure of the leaky bucket parameters including a "second behavioral treatment value" that is used to determine how to treat, or used to direct devices within the network how to treat, a second group of packets. Thus, there is not only no suggestion within the above passage of marking the second group of packets with a second behavioral treatment value, but there is also no suggestion in the above passage of determining a second behavioral treatment value in which "the second behavioral treatment value directs devices within the network to treat the second group of one or more packets with a second quality of service treatment".

Additionally, according to the above passage, the updating of the leaky bucket parameters is performed, in response to a request for an "adjustment of the bandwidth of

the connection". Even after the request, "If the adjustment is accepted, the leaky bucket parameters are updated", but if the adjustment is not accepted, the leaky bucket parameters are not updated. An updated bandwidth is a bandwidth that is set, and not a bandwidth that is "achieved". After setting the bandwidth there is no disclosure in the passages cited by the Office Action of determining traffic characteristics prior to resetting the leaky bucket parameters, and therefore cannot be disclosed to be based on an "achieved flow bandwidth". Thus, the above passage discloses that the new leaky bucket parameters are (1) based on requesting and updating the bandwidth and (2) prior to any flow bandwidth resulting from the set bandwidth can be achieved. Thus, in contrast to claims 1, 5, 9, 13, and 14, in the above passages, adjusting the leaky bucket parameters (which the Office Action associates with treatment determined for the second group of packets) is not based on an "achieved bandwidth flow".

Regarding the Office Action's reliance on Koskelainen et al., column 4, lines 20-29, state,

> The per hop processing is controlled or identified by a command transmitted from the destination node to the controlling node and is diverse in nature. In a preferred embodiment, ***the per hop processing is fully programmable and specifies DSCP values*** which are an indication of processing which the at least one controlling node performs in the differentiated services architecture. However, more generally the per hop processing which is controlled or identified by the command may be to control a QOS, priority of processing, qualitative or quantitative processing, or any other data processing.

Koskelainen et al. use a programmable per hop processing that specifies a DSCP. In contrast to claims 1, 5, 9, 13, and 14, the above passage does not discuss "marking a second group of packets". Further, based on the above passage, one of ordinary skill in the art would expect that, once the per hop processing is programmed, the programming and DSCP values remain the same. Consequently, one of ordinary skill in the art would

expect that once programmed, the manner in which the per hop processing marks and treats the subsequent groups of packets remains the same. Thus, whether or not DSCP is used in the system of Derby et al., there is no disclosure in the passages cited of either Koskelainen et al. or Derby et al. of (1) treating or marking a second group of packets in a different manner than the first group of packets and (2) determining the treatment by which to treat the second group of packets based on an "achieved flow". Instead the new leaky bucket parameters are based on whether or not a request for a new bandwidth is made and accepted and the updated bandwidth rather than the achieved bandwidth is used. In other words, based on the passages cited by the Office Action, a system that modifies Koskelainen et al. in the manner proposed by the Office Action would not meet the claimed device. The resulting system would lack a marking and a treatment of second group of packets with a second behavioral treatment that is based on an achieved bandwidth flow (and not a request or updated bandwidth).

The motivation given by the Office Action for modifying Derby et al. is that Koskelainen et al. (at column 2, lines 25-33) which state that a salient feature of DSCP is scalability. However, there is no evidence that the system of Derby et al. has any issue with scalability or would in any way benefit form the scalability features of DSCP. Further, Derby et al. refer to a leaky bucket mechanism at several key points. For example, Derby et al. state,

> Access control for a packet communications network includes a dynamic bandwidth updating mechanism which continuously monitors the mean bit rate of the signal source and the loss probability of the connection. These values are filtered to remove noise and then used to test whether the values fall within a pre-defined acceptable adaptation region in the mean bit rate, loss probability plane. Values falling outside of this region trigger bandwidth updating procedures which, in turn, ***result in acquiring a new connection bandwidth, and***

> ***determining new filter parameters and new parameters for a leaky bucket access mechanism***. (Abstract)
>
> A leaky bucket mechanism is one technique for controlling access to the network when the traffic exceeds the initial assumptions, but yet permits transparent access to the network when the traffic remains within these initial assumptions. One such leaky bucket mechanism is shown in the copending application.... (Column 1, lines 44-49)
>
> This measurement time can be used to measure not only the statistics of the incoming dam stream to the ***leaky bucket***, but also the effect of the ***leaky bucket*** on the incoming traffic. This latter measurement allows a measure of how well the leaky bucket is dealing with variances in the offered traffic and hence the packet loss probability. (Column 2, lines 46-52)

Also, FIG. 3 includes leaky bucket module 34. Additionally, all of the independent claims of Derby et al. reference the leaky bucket module. Thus, the use of the leaky bucket is a central theme in the Derby et al. patent. The point of the Derby et al. patent is to improve the manner in which a leaky bucket mechanism is implemented. Substituting a DSCP system for the leaky bucket system changes the manner in which the Derby et al. was intended to function, and is therefore not obvious. As stated in MPEP 2143.01, p-2100-127,

> **THE PROPOSED MODIFICATION CANNOT CHANGE THE PRINCIPLE OF OPERATION OF A REFERENCE**
>
> If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959)....

Additionally, Derby et al. is attempting to address problems that arise specifically when using a leaky bucket system. Consequently, if one of ordinary skill had decided to use a DSCP system instead of a leaky bucket system, that hypothetical person would also no longer have seen any reason to use the system of Derby et al. to address the problems in the leaky bucket system not being used.

III. INDEPENDENT CLAIMS 24 AND 25

Claims 24 and 25 include similar language to claims 1, 5, 9, 13, and 14, and are allowable for similar reasons. Additionally, claim 24 recites,

> marking a first group of packets of ***a plurality of data flows*** with an initial set of behavioral treatment values, wherein the first set of behavioral treatment values direct devices within the network to treat the first group packets with an initial set of quality of service treatments;
> determining achieved flow bandwidths, wherein ***an achieved flow bandwidth is determined for each of the plurality of data flows*** based on data traffic within the network;
> determining an updated set of behavioral treatment value*s* based on the achieved flow bandwidth*s* within the network

Claim 25 includes similar recitations in addition to including many additionally patentable features. Thus, in claims 24 and 25 there are a plurality of data flows that are each adjusted. Similar to the other claims, claims 24 and 25 make no mention of adjusting the total bandwidth of all of the data flows. However, this point is further emphasized in claims 24 and 25 by reciting that there are a plurality of data flows.

The Office Action (at page 6) states Derby et al. disclose

> determining achieved flow bandwidth*s*, wherein ***an achieved flow bandwidth is determined for each of the plurality of data flows*** based on data traffic within the network (Derby, Column 6, lines 21 - 27);

The applicants disagree. As explained above, column 6, lines 28-34, recite performing an "***adjustment of the bandwidth of the connection***", and thereby disclose changing the bandwidth of the entire connection, and does not disclose measuring the bandwidth of individual flows in the connection, and of adjusting the individual flows in the connection, which is not related the whether bandwidth of the connection is changed.

IV. NEW DEPENDENT CLAIMS 27-31

New claim 27 recites that "the data flow is associated with only one behavioral treatment at any given time". New claim 28 has similar language. Thus, in claims 27 and 28, the data flow cannot include multiple behavioral treatments, whereas the Office Action apparently associates the entire bandwidth with that of an individual data flow, because in Derby et al. the bandwidth discussed is that of the entire connection. Yet, the Office Action also uses Koskelainen et al. for teaching multiple behavioral treatments. However, in modifying Derby et al. to include multiple behavioral treatments the single achieved dataflow bandwidth monitored in Derby et al. would be modified to include multiple behavioral treatments, in contrast to claims 27 and 28. This difference between the references relied upon in the Office Action and claims 27 and 28 is further emphasized in claim 28 by its dependence of claim 24, which includes multiple data flows in which each has only one behavioral treatment associated with it.

Claim 29 recites that "the achieved flow bandwidth is a percentage of the network bandwidth". Thus, in claim 29 the achieved flow bandwidth is only a percentage of the entire bandwidth of the connection, and not the entire bandwidth of the connection disclosed in Derby et al.

Claim 30 recites that

> the second behavioral treatment results in the dataflow having a different achieved flow bandwidth, which is a different percentage of the network bandwidth.

Thus, in claim 30, in contrast to Derby et al., the adjustment results in the achieved flow bandwidth being a different percentage of the network bandwidth, and the entire bandwidth of the connection does not necessarily change.

New claim 31 recites

> the determining of the second behavioral treatment is in response to a determination of achieved flow bandwidth resulting form the determining of the achieved flow bandwidth.

In contrast, in Derby et al. changing the leaky bucket parameters is performed only in response to a change of the bandwidth of the connection prior to the flow for the changed bandwidth being achieved, and is not performed in response to determining an achieved flow bandwidth.

Thus, new claims 27-31 emphasize that the second group of packets may be marked and treated even if there is no request for an increase in bandwidth of the connection and even if the bandwidth of the connection does not actually change. In contrast, Derby et al. state, "connection agent 32 launches a new bandwidth request on line 37 ***requesting the adjustment of the bandwidth*** of the connection. ***If the adjustment is accepted***, the leaky bucket parameters are updated." In other words, in the above passage of Derby et al. the leaky bucket parameters are adjusted only if the bandwidth is adjusted, and the bandwidth is adjusted only in response to a request to adjust the bandwidth. In contrast, in new claims 27-31, there is a further emphasis that even if the bandwidth remains constant and there is no request for changing the bandwidth, the second treatment value may be determined and used to treat a second group of packets.

V. DEPENDENT CLAIMS 2-4, 6-8, 10-12, 15-23, AND 26-31

Each of claims 2-4, 6-8, and 10-12, 15-23, and 26-31 contain features that depend from one of independent claims 1, 5, 9, 13, 14, 24, and 25. Regarding claims 24 and 25, the Office Action does not rely on *Dillon et al. or Bushmitch*, respectively, for curing any of the deficiencies pointed out above regarding *Derby et al.* Therefore claims 2-4, 6-8, and 10-12, 15-23, and 26-31 are allowable for at least the same reasons as independent claims 1, 5, 9, 13, 14, 24, and 25. Although each of the remaining dependent claims 2-4, 6-8, and 10-12, 15-23, and 26-31 contain features that are separately patentable over the claims from which they depend (as pointed out regarding new claims 27-31, for example), in view of the patentability of independent claims, the remaining dependent claims are not further argued at this time to expedite prosecution.

VI. NEW CLAIMS 32-65

New claims 32-48 are computer readable medium claims corresponding to and reciting the method of method claims 15-31. Similarly, new claims 49-65 are computer apparatus claims corresponding to and reciting the method of claims 15-31. Therefore, claims 32-65 are allowable for at least the same reasons as claims 15-31.

VII. CONCLUSION

For the reasons set forth above, all pending claims are patentable over the art of record. Accordingly, allowance of all claims is hereby respectfully solicited.

The Examiner is respectfully requested to contact the undersigned by telephone if it is believed that such contact would further the examination of the present application.

No extension fee is believed to be due. However, to the extent necessary, Applicants petition for an extension of time under 37 C.F.R. § 1.136. The Commissioner is authorized to charge any fee that may be due in relation to this application to our Deposit Account No. 50-1302.

Respectfully submitted,

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